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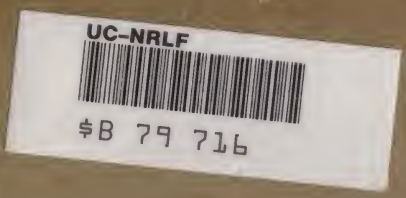

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CATALOGUE

OF

SOUTH AUSTRALIAN MINERALS,

WITH THE

MINES AND OTHER LOCALITIES WHERE FOUND;

AND

BRIEF REMARKS ON THE MODE OF OCCURRENCE OF SOME OF THE PRINCIPAL METALS AND ORES.

Prepared under the authority of the Hon. the Commissioner of Crown Lands,

BY

H. Y. L. BROWN, F.G.S.,

GOVERNMENT GEOLOGIST.

ADELAIDE:

By Authority: C. E. Bristow, Government Printer, North-terrace.

1893.

South Australia Geological dept.

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TN 172
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EXCHANGE

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PREFACE.

THIS Catalogue of Minerals and Localities has been prepared from various sources of information and from the records of this Department. In its compilation information has been derived from the following papers and reports:—Geological and Mineralogical

ERRATA.

Page 6—Line 11—*For* "Line" *read* "Lime."
" 8—Line 19—*For* "Onatha" *read* "Onattra."
" 13—Line 10 from bottom—*For* "Umberalana" *read* "Umberatana."
" 14—Line 10—*For* "Nutt's" *read* "Nott's."
" 19—Last line—*Add* "Ajax," after "Alma."

Page 32—Lines 7 and 8—*For* "Coronet Mine" *read* "Coronet Hill."
" 33—Line 10—*For* "three miles" *read* "twenty-three miles."
" 33—Line 14—*For* "Gn. hornstone" *read* "In hornstone."

A Catalogue of Minerals and Localities, by Mr. G. A. Goyder, was published by this Department in 1883, since which time a great development has occurred in mineral discoveries in the colony.

This Catalogue does not pretend to be complete by any means, as there are doubtless mineral collections in the possession of private persons which have not been available. It is intended to supply those engaged in mining pursuits, prospectors, and others with a record of mineral discoveries for reference, as complete as may be, which will be of use in pointing out where to search for certain minerals.

Under the headings Gold, Copper, Silver-lead, Iron Ores, and Manganese, lists of the mines where these metals have or are being worked are given, together with notes as to their modes of occurrence, which may be of use to prospectors.

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PREFACE.

THIS Catalogue of Minerals and Localities has been prepared from various sources of information and from the records of this Department. In its compilation information has been derived from the following papers and reports:—Geological and Mineralogical Papers, by A. R. C. Selwyn, Esq., F.R.S., &c., Director of Geological Survey of Canada, and Professor G. H. F. Ulrich, F.G.S., &c., Dunedin University; Remarks on the Geology and Mineralogy of South Australia, by Thomas Burr, Esq., at one time Deputy Surveyor-General of this colony; Lists of Minerals, by the late Dr. Mengé, a German geologist, published in the South Australian Almanack for 1841, kindly lent by T. Gill, Esq.; a Catalogue of South Australian Minerals, by T. C. Cloud, Esq., Assoc. Roy. Sch. of Mines, &c., published in the transactions of the Royal Society of South Australia for 1882-3, with the kind permission of the author and of the Council of the Royal Society; and from collections made by G. W. Goyder, Esq., C.M.G., F.G.S., Surveyor-General; G. A. Goyder, Esq., jun., Government Assayer; J. B. Austin, Esq.; the Inspector of Mines; the School of Mines; and myself.

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M77475

The Catalogue has been arranged alphabetically, for convenience in looking up the locality of any particular mineral, and it is hoped will form the nucleus on which a more extensive list may be built up in the future.

H. Y. L. BROWN,
GOVERNMENT GEOLOGIST.

Geological Department,
Adelaide, April 10th, 1893.

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

CATALOGUE OF SOUTH AUSTRALIAN MINERALS.

A

ACTINOLITE.—Amianth Place, Brown Hill, Flaxman's Valley, Lyndoch Valley, Point Pretoria, Rowland's Creek, near Strathalbyn, Wallaroo Bay, Yudanamutana Mine, Daly Mine, Winninnie, Flinders Heights.

AGATE.—All over Central Australia from Hergott Springs northward, on the Diamentina River and Cooper's Creek, at Stuart's Creek and Katherine Telegraph Station. These agates are derived from a pebble bed in the super-cretaceous rocks. Flaxman's Valley.

ALBITE.—Olabidnie Creek.

ALLOPHANE.—South-east district in Miocene rocks.

ALMANDITE.—Mount Babbage, Woodside, Macdonnell Ranges, Hart Ranges, Coffin's Bay.

ALUMINA.—Silicate with soda and sulph. acid. New mineral (?).

AMPHIBOLE. —Moonta and Wallaroo Mines, Tanunda Creek, Angaston, Tungkillo, Franklin Harbor, Mount Torrens, Gawler River, Amianth Place, Pretoria Place, Mount Crawford, Nackara.

ANTIMONY.—Native, Ketchowla (?); sulphide, Mount Fitton Mine.

ANTIMONIAL LEAD ORE.—Aclare Mine.

ANGLESITE.—Wilpena Pound.

ANKERITE.—Gill's Bluff, Mount Bold.

ANNABERGITE.—Young's Mine (near Blinman), Nicholl's Nob.

APATITE.—Kurilla and Wallaroo Mines.

AQUAMARINE.—Mount Crawford, Barossa Ranges, Warren's Property, Amianth Place, Lindsay & Benstead's Mica localities (Hart Ranges, Macdonnell Ranges).

ARRAGONITE.—Wallaroo Mines, Armagh, Blinman, and Oratunga Mines, Mount Bold Mine, Lake Eyre south.

ARSENOPYRITE.—Glen Bar and Talisker Mines, near Victor Harbor, near Woodside Gold Mines, and section 1610, Hundred of Waitpinga.

ASBESTOS AND CROCIDOLITE.—Angaston, New Mecklenburg, Tungkillo, Lobethal Mine, near Menge Town, Animath Place, German Pass, Barossa Range, Umberatana, Arkaba, Tumby Bay (Port Lincoln), Sailors and Watts Gully (Gumeracha), near Arkaroola Creek, near Wooltana, near Mount Barker, Belvidere Range, Flinders Heights, near Mount Fitton Mine (Billy's Springs).

Atacamite.—All Yorke Peninsula Copper Mines; Yudanamutana, Daly, Wheal Turner, Rhondda, Mount Nor'-West, Mount Lyndhurst, Kingston, Mutooroo, Curramulka, Ketchowla, Victory, and Mount Coffin Mines; Wooltana, Teatree Gully Mine.

Augite.—Mount Gambier.

Azurite.—Burra, Kapunda, Blinman, and Yudanamutana Mines; Daly, Stanley, Umberatana, and Wheal Turner Mines; near Franklin Harbor, Mount Bold Mine, Cherry Gardens, near Echunga; Moonta and Kurilla Mines; Kuitpo, Warra Warra, and Clary Mines; Mount Malvern Mine, Elvena Mine.

Alunite.—Forty-five miles south-west of Cootanoorina Station.

Allochroite (Iron Line Garnet).—Hale River (Macdonnell Ranges).

Asbolite.—Near Wooltana.

Alum Shale.—Belvidere Range, Mount Lofty Range, and near Mount Lofty.

Alum Stone.—Alum Creek, Belvidere Range, River Torrens Gorge, ranges near Mount Barker.

Asphaltum.—Coasts of Kangaroo Island, Yorke's Peninsula, and Port Lincoln District; apparently washed up by the sea. The source from which it has been originally derived is, however, at present unknown.

B

Barite.—Burra Mine, Great Gladstone Mine (Mount Brown), Rhondda, Wheal Coglin, Apoinga, Emu Flat, Blinman, and Kapunda Mines; near Saltia, near Blinman, Brighton; Wheal Turner, and Umberatana Mines; Mount Malvern, and Eagle Mines (Glen Osmond).

Beryl.—(*See* Aquamarine.)

Biotite.—Yelta Mine, Williamstown.

Bismuth.—Native—Balhannah Mine, Murninnie Mine, Mount McDonald Mine, Freeling Heights, Mount Freeling, Burrawing Mine, Mount Ogilvie West. (Associated with nickel.)

Bismite.—Mount McDonald Mine, Flinders Heights, Mount Freeling.

Bismuthinite.—Balhannah Mine, Mount Freeling.

Bismuth (Ore).—Eveleen, Mount Wells, and Union (N.T.), between Yudanamutana and Daly Mines; Sir Dominick Daly and Stanley Mines (associated with copper ores); New Era Mine, Woodside (with gold); Mount Rugged, N.N.E. of the Blinman (with copper).

Bismutite.—Balhannah, Daly, and Stanley, and New Era Mines; Forest Range, Teetulpa, Morialta, Mount McDonald Mine, Murninnie Mine, Ironclad Reef, Teetulpa (in quartz in association with gold); Forest River Diggings (in alluvium with gold); Morialta, Fifth Creek (in alluvium with gold).

Bog Iron Ore.—Menge Island.

Bornite.—Moonta, Lady Alice, and Try Again Mines; Barossa, Burra, and Kapunda Mines; Peake Ranges; Mount Searle and Mount Bold Mines; Queen Bee Mine, Mingary.

Breunerite.—Ulooloo.

Bitumen.—(*See* Asphaltum.)

C

Cacholong.—Flaxman's Valley.

Calcite.—Wallaroo, Yudanamutana, Mount Crawford, Ardrossan, Rapid Bay, Mount Gambier, Point Curtis, Macclesfield, Mattawarrugala, Blinman, Cape Jervis, New Mecklenburg, Whyte-Yarcowie, Barossa, Flinders, and Mount Lofty Ranges, Mount Coffin, Curramulka, Angaston Creek, Wheal Nitschke, Mount Nor'-West Well, Dry Creek, Leigh's Creek; South Creek Mine and Avondale Mine; Beltana; near Hallett's Cove (black calcite).

Calamine.—Beltana King Mine.

Cassiterite.—(*See* Tin.)

Celestite.—Wallaroo.

Cerussite.—(*See* Silver, Lead, and Zinc.)

Cerargyrite.—Mount Malvern Mine, Mingary, Mount Freeling, Eagle Mine.

Chalcocite.—Moonta and other Yorke's Peninsula Mines; Kapunda, Montacute, and Burra Mines; Mount Barker, East of Mount Coffin, near Echunga, Duckponds, Wooltana, Mount Bold, Mount Lyndhurst Mine, Wheal Turner, Queen Bee Mine, Mingary, Wheal Danks (N.T.)

Chalcedony.—Angaston, North Para, Redruth, Wallaroo Mine, Ardrossan, Cliffs, at mouth of Onkaparinga River, Barossa Range, Flaxman's Valley, Mount Barker, near the Kapunda Mine, Blanchewater, Innamincka and the Stony Downs and Table Hill country of the Lake Eyre region, Gawler, &c., near Lake Harry Bore (bluish green, transparent, in cavities in brown iron ore).

Chalcostibite.—Near Port Augusta.

Chalybite (spathic iron).—Oratunga Copper Mine.

Chlorite.—Sealand Valley, in quartz, Mount Lofty, and often associated with clay and micaceous slates generally, Gawler Ranges (in felspar porphyry).

Chert.—Found in limestone and dolomite in various parts of the colony.

Chalcopyrite.—Common in most copper mines.

Chloride of Sodium.—(*See* Salt).

Chrysocolla.—Burra, Wallaroo, Kurilla, Nucaleena, Yudanamutana, Mount Lyndhurst, and Mount Barker Mines; Woodlanooka (near Wooltana), Olary Mine, Onatha Mine (near Olary).

Chrysolite.—Mount Gambier.

Cinnamon Stone.—Amianth Place.

Cobalt.—Nichol's Nob and Mount Ogilvie—Smaltite (nickel, cobalt 23·5 per cent., and arsenic), Gersdorffite (nickel 35·1 per cent. sulphur 19·4 per cent., arsenic 45·5 per cent.), and Erythrite (oxide of cobalt 37·6 per cent., arsenic acid 38·4 per cent., and water 24 per cent.). Young's Cobalt Mine, south of and near the Blinman Mine—Erythrite (oxide of cobalt) and nickel, associated with copper ore and silver. Flinders Range Mine, two miles from the Blinman—Cobalt and nickel, associated with copper ores and silver and gold. Mount Ogilvie West (Mount Lyndhurst district)—Nickel associated with bismuth. G.E. Reserve 21, Hundred of Ayers, near the Burra. Cartope Creek, near the Burra, and Gum Creek (reported). Near Willowie—In manganese. Lobethal, twenty-seven and a half miles east of Adelaide (reported). Willowie Forest Reserve—Associated with manganese.

Cobaltite.—Glen Barr Mine, Mount Ogilvie.

Coccolite.—Mount Gambier.

COPPER ORES.

Lodes containing copper ores may be found to a greater or less extent over nearly all the area where the primary rocks outcrop. The Moonta lodes, which are the most important that are now being worked, are enclosed in felspar porphyry—an eruptive rock intruded into granitic and metamorphic country. The Kapunda copper deposits are in argillaceous slates and kaolinized rocks of various colors, accompanied by dark blue pyritous slates. The Burra Burra copper ores were worked in siliceous slates, crystalline limestone, and argillaceous slates and sandstone. The Blinman Mine is in an ore-bearing stratum of siliceous limestone, intersected by veins and

lodes of ore; igneous dykes of granite and greenstone are intruded into argillaceous slates, sandstones, and quartzites forming the country rock. Intrusive dykes of greenstone and other igneous rocks have been noticed as connected with other lodes. Boulder conglomerate, argillaceous and calcareous slates, dolomitic limestone, quartzite, micaceous slates and sandstones also constitute the country rocks enclosing copper lodes. In some instances gold and silver-lead ores are associated with the copper ores, and more rarely bismuth is present. Baryta, ferro-calcite, quartz, ironstone, gossan, and calcspar are some of the chief accompanying constituents of the lodes.

Adelaide, section 5526, Hundred of Onkaparinga.

Angaston, valley of the River Gawler.

Anstey's Mine, on the Highercombe property.

Apex Hill, 176 miles N.N.E. of Port Augusta.

Appealina, three miles north-east of the above.

Arkaroola, near Wooltana.

Aroona, adjoining the Yelta Mine, Yorke Peninsula.

Atlas, on the Moonta and Wallaroo railway.

Balhannah, section 4024, Hundred of Onkaparinga.

Beltana, eighteen miles west of Beltana station.

Belvidere, six miles north-west of Hamilton, on River Light.

Billeroo, 125 miles E.N.E. of Port Augusta.

Black Point, Yorke Peninsula.

Blinman, 120 miles east of Port Augusta.

Bluff Mine, Rosetta Head.

Bon Accord, adjacent to the Burra Mine.

Bremer, thirty-six miles south-east of Adelaide, on the Bremer Creek.

Broughton, on the Broughton River.

Burra Burra, 100 miles from Adelaide.

Burrawing, near Tumby Bay.

Carn Brea, near Robertston.

Challa, adjoining the Paramatta Mine, near Moonta.

Chappel's Lode, near Yudnamutana Mine.

Charlton, on the Rocky river, fourteen miles south-east of Mount Remarkable.

Charlton, two miles north of Wirrabara.

Clive, four miles from Nichol's Knob.

Cocker's Claim, near Mutooroo Mine.

Constitution Hill, four miles south of Mount Serle.

Constitution Hill West, one mile and a half distant from above mine.

Coolanine Mine, Rosetta Head.

Copper Hill (Kulpara Mine), near Moonta.

Copper King, adjoining above.

Copper Valley (Kooroona), adjoining the Hamley Mine.

Cornelius Claims, ten miles south of Benowie station.

Cornwall (New Cornwall), near Kadina.

Crinnis, Angaston district.

Currency Creek, four miles from Goolwa.

Daisy, near Yudnamutana.

Daly, five and a half miles E.N.E. of Yudnamutana.

Davison's Claims, two and a half miles from Blinman Mines.

Depôt Creek, twelve miles from Mount Rose.

Devon Consols, now held as part of the Wallaroo Mine.

Doora, now held as part of the Wallaroo Mine.

Duyrea, one mile south of Wallaroo Mine.

Easther's Claim, hundred of Cudlamudla.

Emu Creek, ten miles north of Beltana railway station.

Emu Flat, south-west of Clare.

Enterprise, near Williamstown.

Euko, south of the North Yelta Mine.

Farina Bore.

Fifth Creek Central, eight and a half miles from Adelaide.

Flinders, one of the Burra Mines.

Gammon Creek.

Gorge, two miles south of Normanville.

Great Blenowie, sixteen miles from Mingary railway station.

Great Britain, Port Wallaroo.

Great Gladstone, thirty-two miles east of Port Augusta.

Great Wheal Oxford (old Reedy Creek Mine), Tungkillo.

Green and Gold, ten miles E.N.E. of Olary.

Grenock Creek, thirty-four miles from Adelaide.

Gregor's Mine, near Parachilna Creek.

Gum Well, fifty-six miles east of Petersburg.

Hamley Mine (old Karkarilla), Moonta.

John Bull, ten miles south-west of Beltana township.

Kanmantoo, thirty-three miles south-east of Adelaide.

Kanmantoo West, adjoining above.

Kannappa, thirty-seven miles E.N.E. of Adelaide.

Kanyaka, fifty-seven miles N.N.E. from Port Augusta.

Kapunda, discovered in 1842.

Karkulto, between Kapunda and Burra.

Kelly's Mine, two and a half miles north-west of Blinman.

Ketchowla, Pandappa Dam.

Kingston, seven miles north-west of Kooringa.

Kirwan, four miles south of Mount Craig, and twelve from Hawker.

Koajeune, three miles east of Wallaroo.

Kooagnie, four miles from Kadina.

Kurilla, now a part of the Wallaroo Mine.

Lake Torrens Mine, adjacent to Beltana Mine.

Leigh's Creek, four miles east of Mount Coffin, and another two miles south-east of Leigh's Creek railway station.

MacDonnell Hill Claims, Outalpa run.

Maitland, four miles north-east of Maitland township.
Malone's Mine, eleven miles from Kanyaka.
Mallee Hut Claim, sixteen miles south of the Blinman.
Matta Matta, included in Wallaroo Mine.
McConville's Mine, six miles south of Kanyaka.
Mid-Moonta, now New Mid-Moonta, near Moonta Mines.
Mildaltie, district of Mingary.
Montacute, ten miles north-east from Adelaide.
Mooloolоo, twenty-eight miles north-east of the Blinman.
Mooloolоo South, adjoining above.
Moonta Mine, discovered in 1861.
Moorowie, on the eastern flank of the Flinders Range.
Mount Bold, east of Clarendon.
Mount Burr, fourteen miles north of Patsey's Springs.
Mount Coffin, forty-one miles N.N.W. of the Blinman.
Mount Elkington, six miles west of the Blinman.
Mount Emily, eleven miles south of the Blinman.
Mount Euro, twenty-eight miles north-east of the Blinman.
Mount Griffiths, on western boundary of the Fifth Creek.
Mount Gunson, one mile west of Pernatty Lagoon.
Mount Hemming, ten miles south-east of Beltana township.
Mount Jacob, near Wooltana.
Mount Liverpool, twenty-six miles north of Port Lincoln.
Mount Lyndhurst, No. II., about seven miles west of above.
Mount Mary, Parachilna Pass.
Mount Remarkable, 175 miles from Adelaide.
Mount Rose, fifty-six miles N.N.E. of the Blinman.
Mount Rose North, adjoining above.
Mount Rugged, nine miles N.N.E. of the Blinman.
Muldana Mine, sixteen miles east of Wonoka.
Mutooroo, fourteen miles south-west of Cockburn railway station.
Mutooroo Station (four miles south of), Mutooroo West, adjoining above.
Nackara, sixty miles north of the Burra.
Nairne.
Nalyappa, south of Moonta and Hamley.
Napoleon, in the neighborhood of Mount Craig.
Neat's, three and a half miles north-east of Caltowie.
Nepowie, near Wooltana.
New Burra Burra, twelve miles east of Hawker.
Nichol's Knob, Mount Lyndhurst district.
Nildottie, twenty-three miles east of the Blinman.
Nilpena, near Parachilna Gap.
Nitschke, near Freeling.

North-east Moonta, between Moonta and Kadina.
North Mutooroo, adjoining the Mutooroo Mine.
North Poona, adjoining the Poona Mine, Yorke's Peninsula.
North Rhine, ten miles from Angaston.
North Yelta, incorporated with the Yelta, Yorke's Peninsula.
Nuccaleena, thirteen miles north-west of the Blinman.
Oladdie, about ten miles from Orroroo, in the Bendleby Ranges.
Old Noll's Mine adjoins the Daly.
Onkaparinga, on the Echunga Diggings.
Oraldana, sixty-eight miles north-west of the Blinman.
Oratunga, about twelve miles north-west of the Blinman.
Orotunga, twelve miles west of the Blinman.
Parabarana, about two miles south-east of Parabarana Hill.
Paramatta, a little north of Moonta.
Parara, near Ardrossan, Yorke's Peninsula.
Paratoo.
Paringa, neighboring the Bremer and Kanmantoo Mines.
Peake Ranges.
Penang, in the vicinity of Moonta Mines.
Phillip's Mine, Rapid Bay.
Pindilpena, on the Parallana Ranges, west of the Yudnamutana.
Poona, near Moonta Mine.
Port Lincoln, four miles from Tumby Bay.
Preamimma, about six miles north-east from Callington.
Premier, New Luxemburg.
Prince Alfred, twenty-eight miles north-east from Carrieton.
Princess Royal, near the Burra.
Queen Bee (copper and gold), twelve miles from Olary
Rae's Claims, west of Crocker's, Mutooroo.
Rawnsley's Bluff, about fourteen miles east of Mernmerna.
Rhynie, four miles west of Riverton.
Rieschbieth's Well, Mount Nor'-West.
Ryan's Claim, hundred of Uroonda.
Scott's Creek, near Cherry Garden.
Scrubbers' Camp, twenty-eight miles north of the Burra.
Sir Dominick, adjoining the Daly Mine (copper with bismuth and gold).
Sliding Rock, 132 miles N.N.E. of Port Augusta.
Smith's, near King's Bluff, Olary.
South Australian Company's Mine, Rapid Bay.
South Creek, four miles north of Burra Well.
South Devon, near Wallaroo Mines.
Spear Creek, twelve miles east of Stirling North.
Spring Creek, eleven miles north of Melrose.

Stainbank's Mine, Fifth Creek.
Stanley, four miles east of Yudnamutana Mine.
Strathalbyn Mines.
Tarlton's Nob, Mount Nor'-West.
Teatree, four miles from Arrowie Station.
Tiddy Widdy, near Ardrossan.
Tower Hill, about twenty miles south-east of Farina.
Tumby Mine, nine miles north of Tumby Bay.
Tungkillo or Reedy Creek, thirty-four miles north-easterly from Adelaide.
Ukaparinga, one and a half miles from Williamstown.
Ulooloo, three miles east of the Ulooloo railway station.
Umberatana, about three miles north of the Wheal Turner.
Vesey's Claim, twelve miles north-east of Nuccaleena.
Victory, three miles east of Mount Bourne.
Vocovocana, west of Apex Hill.
Wakefield, sixty-nine miles north of Adelaide.
Wallaroo Mine, discovered in 1860.
Warrioota, ten miles south-east of Beltana township.
Webb & Robertson's, one mile east of Nichol's Knob.
Welcome, eighteen miles south-east of Yudnamutana Mines.
Wheal Austin, half a mile S.S.W of Yudnamutana Mines.
Wheal Besley, twelve miles north-east of Sliding Rock.
Wheal Blinman, near the Blinman Mine.
Wheal Butler, two miles north-east of the Blinman.
Wheal Fortune, Mount Barker district.
Wheal Frost, close to Yudnamutana Mine.
Wheal Gleeson, Yudnamutana.
Wheal Hancock, adjacent to the Welcome Mine.
Wheal Hughes, near to Moonta Mines.
Wheal Humby, four miles south-west of Moonta.
Wheal James, adjacent to the Wheal Hughes.
Wheal Maria, eighteen miles south-east of Adelaide.
Wheal Sarah, near Clare.
Wheal Stuart, three and a half miles S.S.E. of Moonta.
Wheal Susan, near Parallana.
Wheal Turner, on the Umberalana Run.
Willouran Mine, fourteen miles south-west of Hergott.
Wirrawilka, two miles north of Mount Plantagenet.
Woodloomooka, near Mount Jacob.
Worthing, near Morphett Vale.
Yattagolinga, Rapid Bay.
Yeltro, Yudnamutana Mine.
Yelta, adjoining Moonta Mine.
Yootoomookina, sixteen miles east of Blinman.
Yudanamutana, about sixty miles south-east of Farina.

Copper (Native).—Wallaroo, Moonta, and other mines on Yorke Peninsula, Angaston, Sliding Rock, and Woman-in-White Mine, Boolcoomata; Warra Warra Mine.

Copper.—Glance (75 per cent.), Moonta Mine; black sulphide (70 per cent.), Moonta Mine; silicate, Mount Gunson, Mutooroo, and Daly Mines.

Northern Territory—Port Darwin District. — Brock's, Howley, and Maude Creeks; Chinese Camp, Bridge Creek, Copperfield (four miles south-west of Pine Creek), Daly River Mine (one mile west of Mount Hayward), Eveleen Mine, Glencoe Station, Mount Gardiner, Mount Shoobridge (five miles E.N.E. of), Nott's Camp, Nutt's railway siding (six miles north-east of), Rum Jungle (one and a half miles E.S.E. of railway station), Wallaby and Wheal Danks (adjoining the Daly.)

Covellite.—Yorke's Peninsula Mines and Kapunda, Mildaltie Mine.

Crocidolite.—Wirrawilka, Arkaba, Robertstown.

Cuprite.—Moonta, Spring Creek, Burra, and Kapunda Mines, Wheal Turner, Mutooroo Mine, Queen Bee Mine.

Cyanite.—Macdonnell Ranges, Nuriootpa, Menge Town, Mount Crawford, Amianth Place, Point Pretoria.

COAL.

Mesozoic Coal.—Leigh's Creek. A bed of this coal, 48ft. thick, has been proved, by boring with the diamond drill, to exist at a depth of 1,500ft., and other small veins at a greater depth down to about 1,900ft. What is probably the same seam and of a similar thickness has been sunk through by a shaft distant about one mile from the same bore at a depth of about 300ft.

Kuntha Hill (110 miles northward of Hergott Springs).

Oorowilannie Swamp (near Kuntha Hill).

Warraninna (seventy miles W.N.W. of Hergott Springs).

Lake Harry Bore (?) (twenty miles N. of Hergott Springs).

Lignite. — Hindmarsh Island, near Adelaide railway station, Coffin's Bay (near Port Lincoln), Echunga (deep leads), Mirrabuckina Bore (near Lake Torrens), Nailsworth (near Adelaide, in bore or well), Pidinga (eighty-six miles north of Fowler's Bay), Point Douglass (near Port Lincoln), Port Wakefield (eight miles from), Tea-tree Gully (twelve miles from Adelaide); Murray Flats.

Coorongite.—Salt Creek, on the Coorong; found on the surface of a swamp on sand, in patches resembling pieces of dried leather. Although this substance is of a very similar composition to elaterite (mineral caoutchouc) there is a doubt as to its being a mineral. By some scientific authorities it is regarded as an exudation from a plant or a lichen, and by others as mineral oil evaporated to a solid form. The conditions it is found under are against the latter theory, as a mineral oil in a sufficiently fluid state to spread itself over a sandy surface would, in all probability, become absorbed by and mixed with the sand before evaporation to a solid state could take place.

Carbonaceous Shale.—Leigh's Creek, containing coal beds.

Corundum.—Macdonnell Ranges, Mount Crawford.

D

Diamond.—Echunga, in alluvium with gold; Macdonnell Ranges. (?)

Diallage.—Amianth Place.

Diaptase.—Appealina Mine.

Dolomite.—Victoria Creek, Mount Gambier, Rapid Bay, Mount Barker, Amianth Place, Cornflower Hill, Nichol's Nob, McArthur river (N.T.).

E

Epidote. — Barossa Range, Yudanamutana, Freeling Heights, Amianth Place, Macdonnell Ranges (in granular limestone).

Erythrite (Cobalt Bloom).—Glen Barr Mine, Young's Mine, Blinman.

F

Fahlerz.—Ediacara Mine.

Felspar.—Wherever granite rocks occur.

Fibrolite.—Cornflower Hill.

Flint.—In the older Tertiary limestones of Mount Gambier, MacDonnell Bay, and Bunda Cliffs (Nullarbor Plain), Rivoli Bay. Table hill and stony downs formation of the northern plains.

Fluorite.—Paramatta Mine, Moonta Mine, Field river, and Parara (in limestone), Kapunda Mine, Alma Mine.

GOLD—ALLUVIAL.

By alluvial gold is meant gold which has been derived from the denudation and disintegration of rocks containing auriferous veins by the action of natural forces, the principal agent being water. It is found (1) scattered through the surface deposits covering the bed rock, and sometimes lying upon it; and (2) in gullies which have been watercourses, which have become filled with alluvium washed into them from higher ground in their vicinity; and (3) in deep leads which are alluvial deposits of Tertiary age that filled the beds of ancient Tertiary watercourses at a time when the drainage of the country was on a larger scale, and often in a different direction to that now existing. To a great degree these deposits have been denuded, and fragmentary sections alone remain as cappings on the hills; but in some instances they conform to the contour of the present valleys. The Pliocene drifts of the Barossa Ranges and those covering a considerable area of country in different parts of the main range down as far south as Cape Jervis belong to this category. The Adelaide Plains are also underlaid by similar deposits, as well also as most of the flat country along the main creeks and valleys in many parts of the colony.

There is a probability of alluvial gold, *i.e.*, gold that has been denuded from its matrix, being found in the older Tertiary (or Miocene) rocks, which are understood to have been deposited in lakes and estuaries, and in the conglomerates and gravels of Mesozoic age. Gravel and sand drifts have been proved by boring beneath both the older Tertiary and Mesozoic rocks, where they doubtless fill the basins and channels of ancient lakes and rivers belonging to these periods. The presence or absence of gold in them depends on the proximity of older auriferous rocks from which they were derived by denudation.

The auriferous conglomerate of Algebuckina, on the Neales river, may be of Mesozoic age.

Barossa, Hundreds of Barossa and Para Wirra.—In Tertiary gold drifts and deep leads at Cottiers', Edwards', Goddard's, Green, Hitches', Red, and Victoria Hills; Melville's Rush; Simmons', and White Leads, Bismarck's; Simms' Paddock, and at Yetti Hill; in alluvium at Bullocky, Devil's, Gollop's, Green Hill, Hamlin's, Hissey's, Mary's, Moonta, Nuggetty, Spike, and Vixen Gullies, and at South Para river, section 586.

Echunga, Hundred of Kuitpo.—At Chapel, Windlass, Poor Man's, and Little Bendigo Hills; Chapman's, Break of Day, Diamond, Donkey, German, Hahndorf, Little Bendigo, Long, Poor Man's, Sailor's, Sawmill, and Simond's Gullies; Wattle Flat, Bell's Point, Christmas Rush, and Hough's Paddock. On the Onkaparinga river at Bigg's Flat, Pennyweight Flat, Seaman's Point, Black Sand Corner, Hack's Bridge, &c.

Jupiter Creek Diggings.—At Dead Horse, White, and Foster's Gullies, and Surface and Golden Points.

Highercombe.—Sections 3239, 3242, Yatala.

Mount Crawford and Gumeracha, Hundred of Para Wirra.—At Avenue, Baynes', Dead Horse, B. and T. Tales, Kerosene, Sailors', Snake, Speck, Spring, and Watts' Gullies, and near Kersbrook.

Teetulpa.—At Brady's, Brennan's, Flack's, Goslin's, Strawbridge's, Dam, and other gullies.

Ulooloo.—At Coghlin's and Scrubber's Camp Creeks and White Lead.

Blumberg, hundred of Talunga.—On the following sections, namely:—Nos. 116, 6396, 6624, 6625, 6337, 6332, 6334, 6572, 1673, 6511, 6510, 6524, 6558, 6113, 6060, 6154; and sections 1287, 1288, and 1289, known as the Mount Pleasant Diggings.

Montacute Mine, Sixth Creek.—Sections 5534-5539, along the Gorge of the Torrens river, Fifth Creek, Uraidla, Forest Range, sections 80-85, Inglewood, and Morialta.

Blackwood Gully, Hundred of Kuitpo.—Sections 23, 626.

McTaggart's Paddock.—Section 22, Kuitpo.

Blackfellows' Creek, Hundred of Kuitpo.—On section 292.

Bullaparinga, Second Valley.—Encounter Bay.

Meadows, Hundred of Kuitpo.

Myponga.—On sections 9 and 287, near the junction of the Meadows Creek with the Finniss river.

Woodside, Hundred of Onkaparinga.—Near the Bird-in-Hand and other reefs; and on section 5230, Mount Torrens.

Lyndoch, Hundred of Barossa.—On section 3250.

North Para River, Hundred of Barossa.—On section 586.

King's Bluff.—Mellor's Gully, about four miles from Olary railway station.

Booleroo Springs.—Twelve miles north-east of Leigh's Creek railway station.

Billy's Springs.—Near Mount Fitton, north-east of the main range.

Yudnamutana.—About sixty miles east of Farina.

Twigham.—About two miles east of the Ulooloo Diggings.

Rieschbeith's Well.—In the Mount Nor'-West Ranges, about fifty miles westward of Hergott Springs.

Algebuckina, or Peake Diggings.—On the Neales river, Overland Telegraph Line.

Mintaro.—Near the township (sec. 2153).

Mount Ogilvie.—Near Tower Gap, Mount Lyndhurst Run.

Angepena.

Alluvial gold has also been found and in some instances worked to a limited extent at Waukaringa, Wadnaminga, Mannahill Reefs, Giles's Nob, Noarlunga, Kangaroo Island, Callawonga and Station Creeks (Waitpinga), Cuttaway Hills, Leigh's Creek, at the Peake, Dennison, and Mount Dutton Ranges; and is reported to have been discovered at Clarendon, Currency Creek, Macclesfield, in the Port Lincoln and Franklin Harbor Districts, Hundred of Coglin (near bore), Quartzose Peake (Mount Lyndhurst Run), and Tennant's Creek (N.T.), Lincoln Crossing (near Port Augusta).

NORTHERN TERRITORY OF SOUTH AUSTRALIA.

Port Darwin District.—Bridge, Block's Burgin's, John Bull, Sandy, Snadden's (about ten or twelve miles south-east of Mount Wells), Pine, and Yam Creeks;

Cement, Grierson's, Margaret, Neate's, and Stuart Gullies; Extended Union, Fountain Head, Houschildt's, Howley, Mount Gates, Old Twelve-Mile, Port Darwin Camp, Wulwonga, Union (in slate).

Macdonnell Ranges District.—Arltunga or Paddy's Rockhole, Mount Morgan, Perkins's, The Gap, Thompson's, Fine Gold, Free and Easy, Kangaroo, Kimberley's, Newman's, and Nuggetty Gullies; Paddy's Rockhole Creek; Poverty, Red, Tattersall's, White's and other gullies.

It has been reported also that colours have been obtained at Winnecke's Depôt, Jay's Creek, the Giles, and other places east and west of Alice Springs.

GOLD IN VEINSTONE.

In South Australia gold occurs in the several matrices undermentioned, viz.:—(1) quartz reefs; (2) iron oxides (limonite, hematite, gossan, flucan, &c.); (3) Pyrites (ordinary iron pyrites and arsenical pyrites); (4) kaolin and silico felspathic decomposed veins and dykes; and (5) ferro-calcite (carbonate of lime and iron).

The associated valuable ores and metals are galena or silver-lead, native bismuth and its carbonate, native copper, and ores of nickel, cobalt, and arsenic.

In quartz reefs the gold is often visible to the naked eye, and in some cases in pieces of considerable size; but in the ironstones and gossans it is often so fine as to be invisible. In pyrites this latter is almost always the condition, no gold being visible until the pyrites has been ground up. The kaolin and silico felspathic veinstones are generally small and often irregular, the gold occurring in them in flat, nuggetty pieces, and flat leaves and filaments, and often separated by long intervals of barren sections in the vein. They are apparently decomposed igneous intrusions associated with veinstone.

The occurrence of nuggets in the alluvial drifts may often be due to the denudation of the soft argillaceous strata in which these veins have been formed, and not alone to quartz reefs, which are generally regarded as the matrices of nuggetty gold.

Auriferous quartz reefs occur in gneiss, granite, micaceous and hornblendic schists, and metamorphic sandstone and quartzites; in argillaceous slates and sandstones; in dolomitic limestones and slates; and in brief in all the known Primary rocks. Granite, diorite, porphyry, and other granitic dykes are often found traversing the gold bearing rocks in the neighborhood, or associated with the auriferous veins. The presence of auriferous veins is generally indicated by outcrops of quartz, ferruginous quartz, hematite, limonite, and other oxides of iron in reefs conforming to the strike and bedding of the country rocks, or cutting across them at varying angles. Their underlie varies from vertical to nearly horizontal, and their width or thickness from many feet to a few inches. Their bearing or "strike" is generally more or less meridional, although east and west in some districts. The character of the quartz varies greatly; opaque, transparent, granular, dense, opalline, and ferruginous quartz, have all been observed to contain gold. The upper portions of auriferous veins are generally oxidised, the sulphide of iron being converted into oxides, but this is not invariably the case. The gold exists in shoots, *i.e.*, portions of the reef which are auriferous may be followed down continuously to considerable depths, while other portions along the course of the reef are barren, or else contain a much less proportion of gold.

Small branch veins or "leaders" running across or into the main vein are often richer than the main vein, or the latter is more highly auriferous near the junction. Iron and arsenical pyrites are more or less auriferous in all auriferous veins, but may vary in richness in a similar manner to quartz.

Barossa and Para Wirra.—Goddard's and Moonta Hills, Malcolm's Barossa Mine, with copper ores; Redhill, Gollop's Gully, the Victoria Mine, &c.; Aladdin, Excelsior, Hamlin, Hannaford's Reef, Lady Alice, Lady Edith, New Year's Eve, Try Again, Young Queen, and Young Australian Mines.

Echunga Goldfield.—Bertram's Reef, Big Ben, Chapman's Gully, Comet (or Sunny South), Donkey Hill, Echunga, Golden Reef, Great Eastern, Jackman's, Kangaroo, King, Lawrence's, Plane and Riddle's (now the Crystal Mine), Stirling Reef, Queen, Victoria, Victor George, and other mines.

Blumberg and Gumeracha, Hundred of Talunga.—Black Snake, Blumberg United (section 6334), Burton's (section 6247), Criterion Reef, Durdan's (section 6343), Duscovitch's (section 6339), German Reef (section 7118), McVittie's or McLean's Triumph (section 6340), Mount Torrens, Penrhyn (section 6332), and other mines.

Woodside District, Hundred of Onkaparinga.—Balhannah (section 4024) Banksia (section 4261), Bird-in-Hand (section 5278), Bird-in-Hand Extended (section 5250), Brind (section 5256), Eclipse (section 80), Eureka (section 5259), Fountain Head (section 5241), Mint (section 5259), Mount Charles, Mount's, now Mount Venture (section 4107), Nest Egg, New Era (sections 5263 and 5267), Parliamentary, Ridge, Two-in-the-Bush (section 5261), and other mines.

Uraidla, Hundred of Onkaparinga.

Blackfellows' Creek, Hundred of Kuitpo.

Blackwood Gully, Hundred of Kuitpo.

Sellick's Hill.

Adelaide District.—Montacute, Fifth Creek, Almanda, Victoria (discovered in 1846), section 4232, near Hahndorf; Trevne, near Gawler; Tregoff, near Angaston; Wheal Ellen, Reedy Creek, and other mines.

Myponga.—Mount Magnificent, section 209.

Balparudda and Callawonga Creeks (Waitpinga).

Mannahill Reefs.—Aurora Australis, Birthday, Elsie May, Eudunda Hope, Nectar, No Gammon, Trojan, Westward Ho, and others

Teetulpa Gold Field.—Blue Star, Ironclad, Jubilee, Meaches', Royal Charlie, Victoria, Victory, Warrior, and other reefs.

Wadnaminga Reefs.—Birthday, Commonwealth, Countess of Jersey, Earl of Jersey, Eiffel Tower, Golden Tower, Grand Junction, Holmes' Meridian, Oulnina Tower, Overton's, Victoria Tower, Virginia, &c.

Ulooloo Diggings.—Some of the quartz and ironstone veins have been found to contain gold.

New Luxemburg.—New Mingary Reefs (including the Bismarck, John Brown, and sundry other claims), Mount Brandt, Queen Bee, &c.

Olary District.—King's Bluff, Olary Mine (two and a half miles from railway station), Green and Gold Mine (ten miles from railway station), Woman in White or Mount Cogan Mine (twelve miles from railway station), and other mines; Big Blow (four miles north-east of Outalpa Station).

Waukaringa District.—Alma and Victoria, Alma Extended, Blackfellows' Reef, Daydawn, East Alma, Mid-Alma, Mount Victoria, Waukaringa West, West Alma, Eukaby Silver Mines, &c.

Putt's Well Reefs, twenty-five miles north-west of Mingary railway station.

Wonna Reefs, sixteen miles east of Terowie.—Golden Point, Genial Ben, and others).

Yudnamutana Ranges, sixty miles east of Farina.

Rischbeith's Well, in the Mount Nor'-West Ranges.

Mount Dutton and Peake Ranges.

Mount Ogilvie, near Tower Gap, and Mount Clive (with copper).

Mount Fitton.

Bendleby, Hundred of.—Bendleby Mine.

Eurelia (near).

Wheal Turner Mine.

Kangaroo Island.—Burgess' Reef, Kohinoor Mine, &c.

Angepena.

NORTHERN TERRITORY OF SOUTH AUSTRALIA.

Port Darwin District.—Bridge, Brocks, John Bull, Yam, Maude, Pine (Olaf Jensen's), and Snadden's Creeks; Fountain Head, Houschildts, Howley, Lady Alice, Mounts Gates and Tym, Springhill, Stapleton, Union, South Union, Extended Union, and Wulwonga Reefs, &c. According to the late Rev. J. E. T. Woods, the auriferous lodes traverse argillaceous and micaceous slates, which are surrounded by a belt of granite, and penetrated by diorite granite and porphyry dykes. The vein stone is quartz with pyrites, the outcrop of the lodes being often indicated by masses of iron oxides. Their strike is generally more or less meridional.

Macdonnell Ranges.—Brownhill, Central Australian, Claraville, Grand Junction, Great Matrix, Hale River South, Jubilee, Lindsays, Monarch, Mounts Burrell and Morgan, No Name, Orange Tree, Paddy's Rockhole, Sundown, Surprise, Telegraph, Toolaroo, Wheal Fortune, Wheal Mundi, Wild Irishman, Wipe Out, and other reefs and ironstone veins in the neighborhood of Arltunga. The auriferous vein stones consist of quartz, ferruginous quartz, iron oxides, gossan and pyrites, traversing micaceous and hornblendic gneiss, schists, slates, and limestone (occasionally), with eruptive dykes of granite, diorite, &c. The general strike of the reefs is more or less meridional, although sometimes at right angles to the meridian.

LIKELY AURIFEROUS DISTRICTS.

Gold may be looked for in any of the country occupied by the Primary rocks, and, so far as has been ascertained, it exists over all such country as has been prospected by the gold miner, even to a small extent. The region to the westward of the Musgrave Ranges and that lying between those ranges and Oodnadatta, on the the Alberga river. has not yet been prospected, It is, however, an area possessing all the conditions characterising an auriferous country, and should be examined with a view to the discovery of gold deposits.

G

GALENA.—*(See* Silver-lead.)

GARNET.—Kanmantoo, Bundaleer, Monarto, Yadmana, Belvidere Range, Mount Barker, Amianth Place, Mount Babbage, Coffin's Bay, Mutooroo; Florence, Maud, Illogwa creeks, Hale river, Macdonnell Ranges, Hart's Range, &c.

GILLINGITE.—National Park, Belair.

GIRASOL.—Arkaba, Mount Crawford, Angaston.

GLAUCONITE.—Aldinga Cliffs, Bunda Cliffs, Port Lincoln district, Sleaford Bay.

GRAMMATITE.—Flaxman's Valley, Amianth Place, Cornflower Hill.

GYPSUM.—Wallaroo Mine, Hummock Range, Kanyaka, Kapunda, Wirrialpa, Lake Alexandrina, Beltana Mine, Brighton, Nichol's Nob, Salt Lakes of Yorke Peninsula, the northern plains (including the Lake Eyre and other lake districts), the tableland and stony downs country generally, north of Marion Bay (Yorke Peninsula), plain north-west of Port Augusta.

GRAPHITE.—Warrow and Koppio (Port Lincoln district), Mount Charles (Woodside), Mount Torrens, Flaxman's Valley, Amianth Place, near Tumby Bay, Franklin Harbor, Bimbowrie, near Mount Wells (N.T.), Burrundie, (N.T.)

GERSDORFITE.—Mount Ogilvie, Eveleen, Mount Wells, and Union (N.T.).

H

HEMATITE.—Micaceous—Angaston, Port Lincoln, Inglewood, Bundaleer, Yudanamutana, and Paramatta mines, at Tennant's Creek, and near the Peake, Blinman Mine, Gawler, Barossa, and Mount Lofty ranges, between Avondale Lead Mine and Lesley's Well, near Mount Victoria, Ethiudna Hill, Government Gums, and between Tooth's Nob and Passmore Range, Port Oligistos. Compact columnar (red Hematite)—near Port Lincoln, Wallaroo Mine, Barossa Range, Angaston, Leigh's Creek, Mount Minden, forty miles south-west from Port Augusta, Eudunda, Tennant's Creek, and near the Peake, Point Ogilistos, and Lyndoch Valley; Red Ochre: Parachilna, near Peake, Bugle Ranges, near Macclesfield, Mannahill Reefs, Nuccaleena Mine (with copper), Finke river, twenty miles east of Burrundie (N.T.). *See also* Iron Ores.

HALITE.—Salt lakes throughout the province, Murray Cliffs, neighborhood of the artesian springs of the Hergott and Lake Eyre districts.

HORNSTONE.—*(See* Chert.)

HELIOTROPE.—Stuart's Creek.

HYALITE.—Munno Para Hills, Mulligan Springs.

HYDROPHANE.—Flaxman's Valley.

HORNBLENDE.—Hale river, Macdonnell Ranges, Musgrave Ranges, &c.

I

ICELAND SPAR.—Angaston.

ILMENITE.—Victoria Creek.

IRON.—Meteoric, Gawler Ranges.

IRON ORES.—Bugle Ranges, near Macclesfield, oxides and ochre; Corona, near Port Augusta, Iron Knob, oxides; near Elvina Mine (eleven miles north of Beltana), Flinders Range, twelve miles east of Blinman, oxides (umber and ochre); Gladstone (near to), oxides (used as flux); Gum Creek, near the Burra, oxides with manganese; Hahndorf, oxides (used as flux); Kapunda, oxides (used as flux); Laura (near to); Mount Barker, oxides (used as flux); Mount Jagged Iron Mine, nine miles south-east of Willunga, oxides; Mingary, oxides (used as flux); Olary, near Olary railway station; Oodla Wirra, oxides (used as flux); Port Victor, near Peeralilla Hill, Hindmarsh river, oxide (used as flux); Scrubbers' Camp, near the Burra, oxides; South Rhine, oxides (umber and ochre). On Benowrie and Boolcoomata runs, also twelve miles north of Bimbowrie Head Station, where there are large outcrops, which are about being used for flux in silver smelting. Oxides of iron are common in connection with most lodes and quartz reefs above water level. Iron pyrites, arsenical pyrites, and cupriferous iron pyrites are found below the water level in many localities where these outcrops occur. Pyrites generally contains gold, and at the Alma Mine, Waukaringa, forms its principal matrix.

J

Jasper. — Tableland and stony downs country of Lake Eyre, Diamentina and Cooper's Creek, in pebbles; Yudanamutana Mine, Callana, Willouran, Lake Phillipson.

K

Kaolinite.—Pure white—Wallaroo Mining district, Tanunda, Ardrossan, Hummock Range, Teatree Gully, and near Charlotte Waters, Port Vincent, Gawler Plains, source of the Angas, Flaxman's Valley and Gawler river, Moonta Mines.

Kalinite.—Gorge of the Torrens and Mount Barker Range.

L

Lapis Lazuli.—In white granite, Murray Scrub.

Lignite *(See* Coal).

Limonite.—Angaston, Waukaringa, Blinman Mine, Minjibbie, Yorke's Peninsula, Sixth Creek, near Inglewood, Macclesfield, and Hindmarsh Valley; near Lake Eyre and other parts of Central Australia, Eudunda, and Mount Pleasant district, near the Montacute Copper Mine, Rapid Bay, and Mount Barker, Koonamore Station, and Nichol's Nob, Ediacara Mine, Corona, Port Augusta.

Lydian Stone.—Stony downs and stony plains country of Lake Eyre, Diamentina, and Cooper's Creek, in pebbles.

M

Manganese.—Cold and Wet Station, eight miles from Coondalpyn railway station; Ellen mine, twelve miles south-east of Gordon railway station; Etna Mine, six and a half miles north-east of Gordon railway station; Gordon Mine, eight and a half miles

north-east of Gordon railway station; Scott's Mine, on railway between Orroroo and Hammond; South Australian Mine, Boolcunda Creek, near Willochra; Watts' Sugar-loaf, five miles from Gordon; Willowie Forest Reserve, four miles north of Melrose (this manganese contains 1·7 to 2·81 per cent. of cobalt). Manganese has also been discovered near Carrieton, Orroroo, and Eurelia (McGee's Springs, Kinnane's, and Byerlee's); also sixteen miles north-east of Carrieton. It is also common in small quantities in various other parts of the colony. Pyrolusite—Gordon; psilomelane—Gordon; wad—Parakylia; rhodochrosite—Barossa.

Marble.—Kapunda, Angaston, near Franklin Harbor, Second Valley, Yankalilla, Ardrossan, Curramulka, Carara Hill. Amianth-place, Sixth Creek, Mount Barker, Macclesfield, Flinders Heights, Billy's Springs, &c.

Mica.—Cornflower Hill, Amianth-place, Jacob's Glen, Keyserstuhl, Mount Crawford.

Muscovite (Mica).—Mount Pleasant, Williamstown, Barossa Range, Mount Crawford, near Yankalilla, and generally wherever granite rocks occur. Macdonnell Ranges district (N.T.), Bensted's Mine, eight miles south-west of Mount Brassey, Chambers, Oliver & Berrys' Fallon's, and other claims in Hart's Range, Lindsay's Mine on Talc Creek, Watson's Creek, Onatta Creek; near Glen Helen Station, Western Macdonnell Ranges, Algebuckina.

Magnesite.—Flinders Range, near Port Pirie, Hundred of Cunningham; Oolabidnie Creek, Blinman, Mount Lofty and Barossa Ranges, Government Farm, Amianth Place and German Pass, Macdonnell Ranges, Glen Osmond.

Magnitite.—Near Mount Jagged, Mount Lofty; crystallised and massive—from Cape Jervis to Black Rock Hill generally, the Peake, Hundred of Cunningham, Mount Torrens, Mount Victoria, New Cornwall Mine, Queen Gold Mine, Yudanamutana Mine. Micaceous boulder—Yerclina Creek; massive—Winninninie, German Pass, Aldinga, Musgrave Ranges, Hale River, Macdonnell Ranges; and accompanying granite rocks generally, *in situ* and as eroded sand.

Malachite.—Crystallised—Rhondda and Wallaroo Mines; nodular radiated crystalline—north of Port Augusta; massive—Burra, &c., Mount Barker, Montacute Mine, Wakefield, Rapid Bay and Noarlunga, the Peake and near Beltana, Daly and Stanley Mines, Mount Lyndhurst, Nichol's Nob, Tarlton's Nob, Mount Victoria, Yudanamutana Mine, road between Temple Bar and Blinman, and between Avondale and Leslie's Well, Mount Wells (N.T.), Warra Warra Mine, Wheal Turner, Queen Bee Mine, Mingary, Mount Fitton Mine, Glen Ferdinand (Musgrave Ranges), Blinman Mine.

Mirabilite.—Crystal Brook.

Molybdenite.—Yelta, Moonta, Wallaroo, and Kurilla Mines, near Franklin Harbor.

N

Nephrite (var. Amphibole).—Amianth Place.

Nitre.—Murray Cliffs.

Nickel.—Eveleen Mine (N.T.); quartz, stained with nickel, Tomkinson's Range.

Nickel Glance.—*(Vide* Gersdorffite, under Cobalt.)

Nickel Ores—*(See* Cobalt).

O

Olivine.—Mount Gambier, Mount Schank.

Opal (common).—Angaston, Mount Crawford, Nuriootpa, Yudanamutana, Kelly's Well and near the Peake, Flaxman's Valley, Amianth Place.

Orthoclase.—Angaston, near the Wallaroo Mines, Ardrossan, Barossa Range, near Mount Barker.

Ochre.—Red, yellow, associated with ferruginous lodes and other deposits, at numerous places.

Obsidian.—Has been found in alluvium and on the surface generally in round button-shaped pieces all over the province, although most frequent on the stony downs and table-hill country of the Far North, where its presence, so far away from any volcanic centre, is most difficult to account for.

P

Pearlspar (var. Dolomite).—Rapid Bay.

Penninite.—Near Beltana.

Pentlandite.—Port Lincoln District.

Phosgenite.—West coast of Spencer's Gulf, Glen Osmond Mine.

Pitticite.—Near Nairne.

Pistomesite.—Balhannah Mine, Nuccaleena Mine.

Plasma (var. Quartz).—Near Mount Morgan.

Prehnite.—Amianth Place.

Psilomelane.—Sleaford Bay, Elder's Nob.

Pyrite.—(*See* Iron Ores).

Pyroeusite.—Wallaroo Mines, Pandappa Dam, Waukaringa, Tintara, Blinman, Mount Burrell (N.T.)

Pyromorphite.—Glen Osmond, west coast of Spencer's Gulf, Strathalbyn Mine, Avondale Mine, Farina, Hahndorf, Eukaby.

Pyrope (var. Garnet).—Hamilton Creek, near Mount Babbage.

Pyroxene.—Mount Schank.

Q

Quartz.—Rock crystal—Mining district of Yorke Peninsula, Angaston, Barossa Range, near Clare, Coonatto, Central Australia, Charlotte Waters, Emu Flat, Green's Plains, Highbury, Lake Hope, Lyndoch Valley and Stanley Mine, Morialta, Pekina, Tanunda Creek, and Williamstown, Belvidere Range, Encounter Bay, Flaxman's Valley, Mount Barker, and Montacute Mine, Crystal Hill, Blanchewater, Innamincka and Victoria Gold Mine, Gawler River; amethystine—Wallaroo Mine and Point Riley; rose—Hundred of Cunningham. Montacute Mine; bronze colored crystals—Stanley Mine and Emu Flat, Mount Wells; milky—Wallaroo Mine, the Peake; smoky—Wallaroo Mine, Angaston and Mount Crawford, Belvidere Ranges, Cornflower Hill.

Quartz (False Topaz).—Clear crystals, more or less waterworn, are frequently found on the surface of the stony downs and table-hill country (Lake Eyre, Diamentina, and Cooper's Creek), they are erroneously called topaz.

Quicksilver.—(*Vide* Mercury.)

R

Rhodonite.—Elder's Nob.

Rocksilk (var. Asbestos).—In opal, Amianth Place.

Rubellite (var. Tourmaline).—Valley of the Nixon.

Rutile.—Near Balhannah, Collingrove, Encounter Bay, Lyndoch and Tanunda Creek, Echunga and near Oonatra Water, near Victor Harbor, in felspar and in quartz; Lower Meadows, Watts Gully, Gumeracha Diggings, Mount Crawford, Morialta Diggings, Noarlunga.

Resin.—In lignite in the various localities where it occurs. On the west coast and that of Kangaroo Island.

S

Salt.—As a surface deposit encrusting the mud beds of coastal and inland lakes, *e.g.* the Coorong, Lake Eyre, &c., and in the neighborhood of the mound springs of the interior. In solution in the water of many wells and lakes in various parts of the colony, and in the waterholes of the inland rivers running into Lake Eyre.

Satin Spar—(var. gypsum)—Stuart Range.

Sapphire.—Echunga (?), Macdonnell Ranges.

Selenite—(var. Gypsum)—In many salt lakes, especially on Yorke's Peninsula. (*See* Gypsum.)

Serpentine. — Sailors Gully, Gumeracha; (verde-antique), Mount Crawford; Iron Nob (west of Port Augusta), Tumby Bay, Port Lincoln.

Siderite.—Crinnis Mine, Oratunga Mine, Eudunda, Rapid Bay, Barossa and Mount Lofty Ranges, Karculto Mine, near Blinman; Nilpena Run.

Siliceous Sinter—(var. Quartz.)—Angaston, Barossa Ranges, Mount Barker, Flaxman's Valley.

SILVER-LEAD AND ZINC.

Veins containing argentiferous ores are, in South Australia, always associated with galena, or sulphide of lead, and cerussite, or carbonate of lead, with or without ores of copper. These veins may occur in any part of the area occupied by Primary

rocks, and are found chiefly in fissure lodes. There is an exceptional instance in the case of the Ediacara Mine, where the silver-lead deposits occur as segregated masses in a soft argillaceous bed, where also crystalline dolomitic limestone possesses veins of galena and carbonate of lead. and occasionally fahlerz ore. Most of the silver-lead lodes contain a percentage of zinc-blende (sulphide), which renders them refractory in the processes of smelting and extraction of the silver. Chlorides and iodides of silver have been found in the Ediacara, Fifth Creek Central, Mount Malvern, Eagle, and other mines. Arsenides and phosphates of lead have also been observed. Gold also occurs in association with silver-lead in the ores of Eukaby, Wheal Ellen, and other mines. Baryta, calcspar, quartz, gossan, ironstone, &c., are some of the chief associated veinstones.

Zinc blende (sulphide) associates with galena (sulphide of lead) in many of the silver-lead mines. It is regarded as a deleterious ingredient, as it creates a difficulty in the treatment of the silver ores, and up to the present time it has not been found in sufficiently large quantities to render mining for zinc as a distinct product worthy of specific attention.

Aclare Mine, three miles from Calilington Railway Station.—Argentiferous galena and zinc blende.

Almanda Mine, eighteen miles south-east of Adelaide.—Silver and gold.

Avondale Mine, fifteen miles east of Mount Lyndhurst Railway Station.—Argentiferous galena.

Barrett's Mine, Normanville.—Argentiferous galena.

Basham's Blow, Port Elliot.—Silver and copper.

Beltana Broken Hill, near Beltana.—Argentiferous carbonate of lead and galena.

Beltana North, Old Beltana Mine, and others.—Argentiferous carbonate of lead and galena.

Belvidere Mine, near Riverton.—Argentiferous galena and copper.

Bird-in-Hand.—Galena and zinc blende.

Bugle Ranges.—Argentiferous galena.

Buttamuk Mine, Hundred of Coglin.—Silver in iron oxide.

Campbell's Creek, two miles east of Cape Jervis.—Argentiferous galena.

Cherry Gardens, twelve miles south of Adelaide.—Argentiferous galena.

Cockscomb Ranges, six miles from Winnininnie Railway Station.—Argentiferous galena.

Coolanine Mine, Rosetta Head, Port Victor.—Galena.

Copperalinka, sixteen miles east of Mannahill Railway Station.—Argentiferous galena.

Dalkey Hill, five miles from New Luxemburg.—Argentiferous galena.

Dark Hill, two miles south-east of Giles' Knob, on Oulnina Run.—Carbonate of lead and argentiferous galena.

Dixon's Claims, two miles west of Taltabooka Well, Oulnina Run.—Argentiferous galena.

Eagle Mine, section 1003, Hundred of Adelaide.—Argentiferous galena, carbonate of lead, and chloride of silver.

Ediacara Mine.—Argentiferous carbonate of lead and galena, silver glance and chloride of silver.

Emily Mine, near Big Hill.—Argentiferous galena.

Eukaby Mines, forty-eight miles east of Hawker.—Carbonate of lead and argentiferous and auriferous galena.

Fifth Creek Central Mine, eight and a half miles from Adelaide.—Chloride of silver.

Flinders Mine, three miles west of Wirrialpa Mine.—Argentiferous galena.

Fountain Head Mine, between Blinman and Wirrialpa.—Argentiferous galena and carbonate of lead.

Gilles Glen Osmond Mine, three and a half miles from Adelaide.—Argentiferous galena and carbonate of lead.

Gilead P. Beck Mine, Freeling Waters, Farina District.—Argentiferous galena.

Glenalbyn Mine, one mile north-west of Strathalbyn.—Argentiferous galena.

Glen Osmond Union Mine, near Adelaide.—Argentiferous galena and carbonate of lead.

Golden Gully, ten miles north of Petersburg Railway Station.—Argentiferous galena.

Great Gladstone Mine, Pindilpena Creek.—Argentiferous galena.

Hooper's Luck, five miles south-west of Waukaringa.—Argentiferous galena.

Hahndorf Mine.—Argentiferous galena.

Imperial Mint Mine, near Mount Serle.—Argentiferous galena.

Kangarilla Mine, sections 797 and 796, hundred of Kuitpo.—Argentiferous galena and carbonate of plumbago.

Kangaroo Island, Western river.—Carbonate of lead and argentiferous galena.

Keyneton King and Keyneton Proprietary Mines, near Keyneton, Hundred of North Rhine.—Argentiferous galena.

Lady Elizabeth, one mile south of Olary Railway Station.—Argentiferous galena.

Lobethal, Mount Bold, Hundred of Noarlunga.

Mangolo Creek, Wicklow Hut, Franklin Harbor District.—Argentiferous galena.

Mannahill, eight miles south of the Railway Station.—Argentiferous galena.

Mildaltie Mine, seven miles from Olary.—Argentiferous galena.

Mildottie, twenty-three miles east of Blinman.—Galena.

McArthur River, McKinlay and Mount Wells, N.T.

Moore's Mine, one and a half miles south-south-east of Mingary Reef.—Argentiferous galena.

Mount Bold.—Argentiferous copper pyrites.

Mount Emily, eleven miles south of the Blinman.—Galena.

Mount Freeling, one mile north.—Galena.

Mount Lofty Park Mine, section 840, hundred of Onkaparinga.—Argentiferous galena and zinc blende.

Mount Malvern, Cherry Gardens.—Argentiferous galena, and argentiferous copper.

Mount Osmond Mine, Glen Osmond.—Argentiferous galena.

Mount Perseverence, three miles from Olary Railway Station.—Argentiferous galena and copper.

Mount Rhine Mine, section 17, hundred of Angas.—Argentiferous galena.

Mount Serle, Stuart's Waterholes, Frome Well, Finke Springs, and Patsey's Springs, near Mount Serle Station.—Argentiferous galena and carbonates.

Muldanippa Hill, Oulnina Run.—Galena.

Niltibury and Weepowie Mine, eight miles north-east of Blinman.—Argentiferous galena.

Old Strathalbyn Mine, near Wheal Ellen.—Argentiferous galena, carbonate of lead, and zinc blende.

Olary Silver Mine, three miles from Railway Station.—Argentiferous galena.

Phillips' Mine, near Rapid Bay (Talisker).—Argentiferous galena.

Premier, New Luxemberg.—Argentiferous galena.

Prince Albert and Great Western Mines, near Dark Hill.—Carbonate of lead and argentiferous galena.

Rhineberg Mine, section 38, Hundred of Angas.—Argentiferous galena.

Rhine Valley and Mount Frederick Mines.—Argentiferous galena.

Riversedge Mine, on the Torrens, thirteen miles from Adelaide.—Argentiferous galena.

Royal Keyneton Mine, sections 825, 826, and 828, hundred of North Rhine.—Argentiferous galena.

Rufus and Sunbeam Mines, near Mount Victor.—Argentiferous galena.

Ryland's Claim, Rum Jungle.—20oz. with 40 per cent. copper.

Scott's Creek Mine, three miles from Callington Railway Station.—Argentiferous galena.

Sellick's Hill, near Willunga.—Argentiferous galena.

Snug Cove, Kangaroo Island.—Carbonate of lead and argentiferous galena.

South Australian Broken Hill Mine, near Wadnaminga.—Carbonate of lead and argentiferous galena.

Stainbank's Mine, Fifth Creek.

Talisker Mine, fifteen miles south of Normanville.—Arsenite, phosphate and carbonate of lead, and argentiferous galena.

Taltabooka, Dixon's claims, north-east.—Argentiferous galena.

Teatree Gully Mine, nine miles from Adelaide.—Ironstone, containing traces of silver.

Three Blocks Mine, Oulnina Run, Mannahill.—Argentiferous galena.

Trinkaleena Mine, sixteen miles east of Mannahill.—Argentiferous galena.

Twelve-Mile (east of), N.T.

Two-in-the-Bush—Galena and blende.

Uncle Tom Mine, near New Mingary Mine.—Argentiferous galena.

Ulooloo Diggings, sections 670, 651, and 673.—Galena.

Virginia Mine.

Wadnaminga Reefs, near Mannahill.—Galena.

Waukaringa, a few miles west of Blackfellows' Reef.—Argentiferous galena.

Wheal Coglin Mine, three miles from Rapid Bay.—Argentiferous galena.

Wheal Ellen Mine, near Strathalbyn.—Argentiferous galena, zinc blende, and copper ores, with auriferous gossan.

Wheelbarrow Range.—Galena.

Wheal Gawler Mine, Glen Osmond.—Carbonate of lead and argentiferous galena.

Wheal Margaret Mine, near Mount Barker.—Argentiferous galena, carbonate of lead, and zinc blende with copper ores.

Wheal Maria; eighteen miles south of Adelaide.—Argentiferous galena.

Wheal Mary, near Normanville.—Argentiferous galena.

Wheal Watkins, section 910, Glen Osmond.—Carbonate of lead and argentiferous galena.

Wilpena Mine, fifty-three miles north-east of Hawker.—Carbonate of lead and argentiferous galena.

Wirrialpa Mine, twenty miles east of Blinman.—Carbonate of lead and argentiferous galena.

Yattagolinga, Rapid Bay.—Argentiferous galena.

SILVER-LEAD AND CARBONATES.

Port Darwin District.—Localities—Barney's, Bull's. and Yam creeks; Coronet Mine, Mary river; Eleanora and Eveleen mines. Flora Bell, Jansen's. McKinlay and Mount Wells, Mount Todd (two miles west from), Rum Jungle (one and a half miles south-east of the railway station), Scott's, Cattle Creek, Star of Bethlehem, Princess Louise.

Macdonnell Ranges District.—Claraville Claim and near Arltunga.

Soapstone (var. Talc).—Lyndoch Valley, Rowland's Flat, near Gumeracha.

Sphalerite. — Wallaroo Mines, between Point Pearce and Corny Point, North Rhine, Wheal Ellen, Two-in-the-Bush Mine, Aclare Mine.

Sphene (var. Titanite).—Brown Hill.

Steatite (var. Talc).—New Mecklenburg, near Gumeracha, Moonta Mines.

Stilpnomelane.—Oakbank.

Sulphur.—Native—Echunga, Montacute Mine, Waitpinga (in quartz cavities), with barita— Spring Creek, Mount Remarkable; with melanterite—Weathered Hill, Blanchewater.

Shale (Carbonaceous).—Leigh's Creek, Kuntha Hill, McArthur river (N.T.)

T

Talc.—Kaiserstul, crystallised—Menge Town; bronze colored—Yorke Peninsula; white—Barossa Range and Kanmantoo, Belvidere Range and River Hutt; earthy —Amianth Place; silver-white foliated, in magnesian limestone—Jane Valley; indurated red and yellow— Lyndoch Valley; floury foliated—Rowland's Creek, Armagh, near Jamestown.

PORT DARWIN DISTRICT.

Tin (Alluvial) Oxide.—Localities—Hann's tin claim (two and a half miles south-west of Springhill), McKinlay (one and a half miles south of Burrundie), and Snadden's Creek (ten or twelve miles south-east of Mount Wells).

Tin (Reef) Oxide.—Localities—Beetson's claim (three miles north of Mount Shoobridge), Hann's claim (two and a half miles south-west of Springhill), Hugh Watts, Howley, G. L. Barrett's (one and a half miles south-east of Mount Shoobridge), Leviathan Mine, Leviathan river, western branch of River Anne, McKinlay (one and a half miles south of Burrundie), Mount Lynes (eight miles south-east of the Leviathan), Mount Shoobridge, Mount Tolmer (three miles north-west of Adelaide river railway station), Mount Wells and Pickford's, River Anne. Twelve Mile; Daly river district. In ironstone, Mount Todd (13 per cent. tin). Cosmopolitan Hills, Howley district, Bynoe Harbor; Finniss river.

Tin Pyrites (? Stannite).—Gn. hornstone—Barossa Range; Northern Territory—Mount Lynes, Barrett's claim, near Shoobridge; Leviathan claim, Bynoe Harbor.

The tin ore, according to the Rev. J. E. T. Woods and Mr. J. V. Parkes, occurs in porphyry and greissen dykes; sometimes, though rarely, in quartz.

Titanic Iron (Mennaccanite).—In quartz—Benowrie, Cornflower Hill.

Touchstone (var. Quartz).—Alum Creek.

Tourmaline.—Angaston, Ardrossan, Mount Crawford, and Moonta and Paramatta Mines; Mount Boothby, Barrow's Creek, and near the Peak; Barossa Range, Encounter Bay, Rapid Bay, Valley of the Nixon, Mount Torrens; black—in felspar, in quartz, and in mica, crystallised—in nine-sided prisms with summits of the primitive rhombohedron—in felspar and with tombac brown mica, Cornflower Hill, Flinders Heights, Moonta Mine, near Port Augusta, Wallaroo Bay, N.W. of Smelting Works, green in quartz, Running Water, Hale river Macdonnell Ranges.

Travertine.—Limestone along the coasts coating Tertiary limestone, also coating Palæozoic limestones and calcareous rocks generally. Deposited from the mound and other springs over the province generally.

Tremolite (var. Hornblende).—Victoria Creek, Williamstown, Barossa Range, Flaxman's Valley, Flinders Heights.

U

Ullmanite.—Mount Lyndhurst, Gill's Bluff (nickel, 25 to 28 per cent.; antimony and sulphur).

V

Vivianite.—Angaston, Mount Rufus, near Strathalbyn, Rowland's Creek.

W

Wavelite.—In gneiss—River Gawler.

Wolframite.—Onkaparinga, Port Victor.

Wulfenite.—Avondale Mine, near Farina.

Z

Zinc.—(native) Forest Range Diggings.

Zinc Blende.—*(See* Silver Lead).

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